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Reflections on Blended Distributed Learning: The Armor Captains Career Course

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14. ABSTRACT *(Maximum 200 words)*:

The purpose of this study was to investigate how various distributed learning technologies impacted the training of Armor officers in an advanced course, the Captains Career Course. There were three phases to this course – asynchronous, synchronous, and residential. At the completion of one complete course iteration, two groups of students, as well as three instructors and the course advisor, were interviewed regarding their experiences with the online learning components. Each group mentioned distinct advantages and disadvantages from the different online components including greater and timelier feedback, realistic scenarios, downtime due to technology problems, and an overwhelming choice of tools and options. Ten key Web-based instruction considerations or issues were mentioned across participants and several recommendations for improving this program and building similar ones were provided.

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INTRODUCTION

The importance of a highly trained and skilled military has never been greater than today. Rising to meet this need is the capability to train personnel anywhere in the world at any time using distributed learning (TRADOC, 1999). Cost and course accessibility are two key factors fueling distributed learning experimentation and development. In business and industry, projected savings of 30 to 60 percent over traditional classroom instruction has placed e-learning in the spotlight (Fortune, 2001). Many questions remain, however, about the return on investment related to e-learning expenditures and investments (Raths, 2001; Worthen, 2001). As distance learning technology contracts are announced and new policies are enacted, there is a growing need for research on distributed learning courses and programs (Bonk & Wisher, 2000).

Organizations are devoting increasing time and energy to online training (Bonk, 2002; Training, 2000; Urdan & Weggen, 2000). Perhaps the fastest growing aspect of this movement is a blended approach that weaves together training approaches and technologies as needed (Ganzel, 2001). In blended learning, instructors might embed Web-based instruction with live instruction, utilize the Web to supplement live instruction, or combine segments of a Web course that are self-paced with those requiring significant instructor presence and guidance (Bonk, 2002; Rowe, 2000). Still another model would combine opportunities for live Web-based instruction with delayed or asynchronous online instruction as well as with face-to-face meetings. Research by Kang (1998), for instance, revealed that such combined approaches impact student social identity and relationships, team building, and decision-making, as well as the mentoring, scaffolding, and overall roles of the instructor.

Online Incentives and Motivators

At the heart of such research is a learner-centered model that provides choice, meaningful activities, project-based learning, and opportunities for student interaction and active learning (Lotus Institute, 1996; Report of the Commission on Technology and Adult Learning, 2001). When incorporating a learner-centered model, the role of the instructor shifts from transmitter of knowledge to that of facilitator or coach in the process (Bonk, Wisher, & Lee, in press). Of course, instructors have a myriad of roles and responsibilities to coordinate for e-learning success, including pedagogical, social, organizational, and managerial roles (Anderson, Rourke, Garrison, & Archer, 2001; Bonk, Kirkley, Hara, & Dennen, 2001; Mason, 1991). A delicate and informed balance between these roles is vital to e-learning success.

With any new teaching and learning environment come numerous challenges and concerns. One challenge often mentioned within online training environments is motivating and engaging students in order to boost retention and course completion rates (Phelps, Wells, & Hahn, 1991). While some claim that tests show better student retention rates for e-learning classes than for traditional instruction (Galagan, 2001), a recent survey of 201 corporate trainers and administrators revealed fairly dismal e-learning completion rates across many types and sizes of organizations (Bonk, 2002). Similarly, a study of asynchronous learning using

computer-mediated communication in a military training setting showed some cost and learning improvements over traditional instruction, but student completion rates were lower, due, in part, to family and job commitments (Phelps, Wells, et al., 1991). The extent of learning gains and completion rate differences, however, were not consistent across the online courses (Phelps, Ashworth, & Hahn, 1991).

In addressing this predicament, Moshinskie (2001) created a model related to motivation in e-learning environments that targets the improvement of learner motivation before, during, and after online courses. He listed a number of extrinsic devices (e.g., supportive learning environments, compensation, certification, paid time off, gifts, etc.) that might complement student intrinsic needs. In terms of supportive environments, Moshinskie noted the success that Motorola has experienced when providing human contact and social support to first-time e-learners during the initial weeks of an online course.

In a recent survey of 201 corporate trainers and training managers, however, Bonk (2002) found that most organizations did not offer incentives for the completion of online courses. Among those that did, the most common incentive was increased job responsibility. Common course activities and motivational strategies were also explored in this study. Motivational factors perceived as important in that study were the use of relevant materials, responsive feedback, goal-driven activities, choice and flexibility, opportunities for personal growth, fun, interactivity and collaboration, and variety. Specific techniques or activities that these trainers and designers deemed highly engaging and useful included case activities and job reflections, brainstorming, group tasks and teamwork, electronic mentoring and online guests, and students taking the initiative to lead discussion. What was interesting was the low support for both online conflict and psychological safety or belongingness. Surprisingly, social tasks and icebreakers, as well as opportunities to display or share products, received the lowest support from the twelve listed motivational activities in this particular survey.

Online Benefits

While there may be problems related to online learning incentives and motivational tools, many reports continue to focus on the employee and employer benefits of online training technologies and environments. For instance, Urdan and Weggen (2000) point to just-in-time access to information, faster learning and higher retention through personalized learning, substantial cost savings by eliminating travel, improved interactivity and collaboration among students, less intimidation by instructors, and the ability for anyone to learn anywhere and at anytime. Unfortunately, these authors provide few empirical studies to back up these claims. And, in certain situations, many of these advantages might be perceived as disadvantages For example, arguments that online content is fresh, consistent, and constantly updated requires organizations and instructors to spend extensive time and money to keep their teaching and training materials up-to-date. Along these same lines, the elimination of travel will obviously decrease natural face-to-face interaction and opportunities to share personal experiences and relevant stories. Furthermore, the ability to learn anywhere or anytime expands the time requirements of the course, thereby forcing instructors to monitor course activities for extended hours.

Murray and Bloom (2000) provide a more research-referenced list of employee and employer benefits related to e-learning. In terms of employers, online learning technologies can provide: (1) cost savings, (2) flexibility in content design and delivery, (3) increased interaction

and collaboration, (4) learning that is directly linked to work, (5) decentralized learning, (6) training aligned to current job-related needs, (7) the motivation for employees to invest time and energy into learning, and (8) enhanced learning retention. In terms of employees, online technologies provide: (1) more control over learning, (2) focused and relevant learning matched to individual learning needs, (3) skills that increase one's value to the organization, (4) improved self-confidence, (5) new competencies that enhance job satisfaction, (6) skills that boost job productivity and performance, (7) mechanisms for tracking and recognizing achievement, (8) information leading to safer work environments, and (9) opportunities to use learning technologies that bolster one's e-literacy. Naturally, Murray and Bloom discuss many challenges within these environments, including technology limitations, system difficulty, measurement failures, management resistance to change, poor planning and direction, a lack of innovation champions, learner resistance to online training, and a lack of time, money, and support.

The purpose of this research is to understand how a blended or hybrid approach to e-learning impacted the professional development of students in a high-level military training course. The research addresses e-learning from the perspectives of the course learners, the DL Education Advisor, and the instructors. Interviews with these individuals helped document distinct advantages and disadvantages from different components of the course. Issues and considerations for e-learning mentioned consistently across groups should help with future course design and delivery methods. In effect, this research might help in forming instructional design principles for the Web as well as in the fine-tuning of this particular program and ones similar to it.

RESEARCH OVERVIEW

Background Information

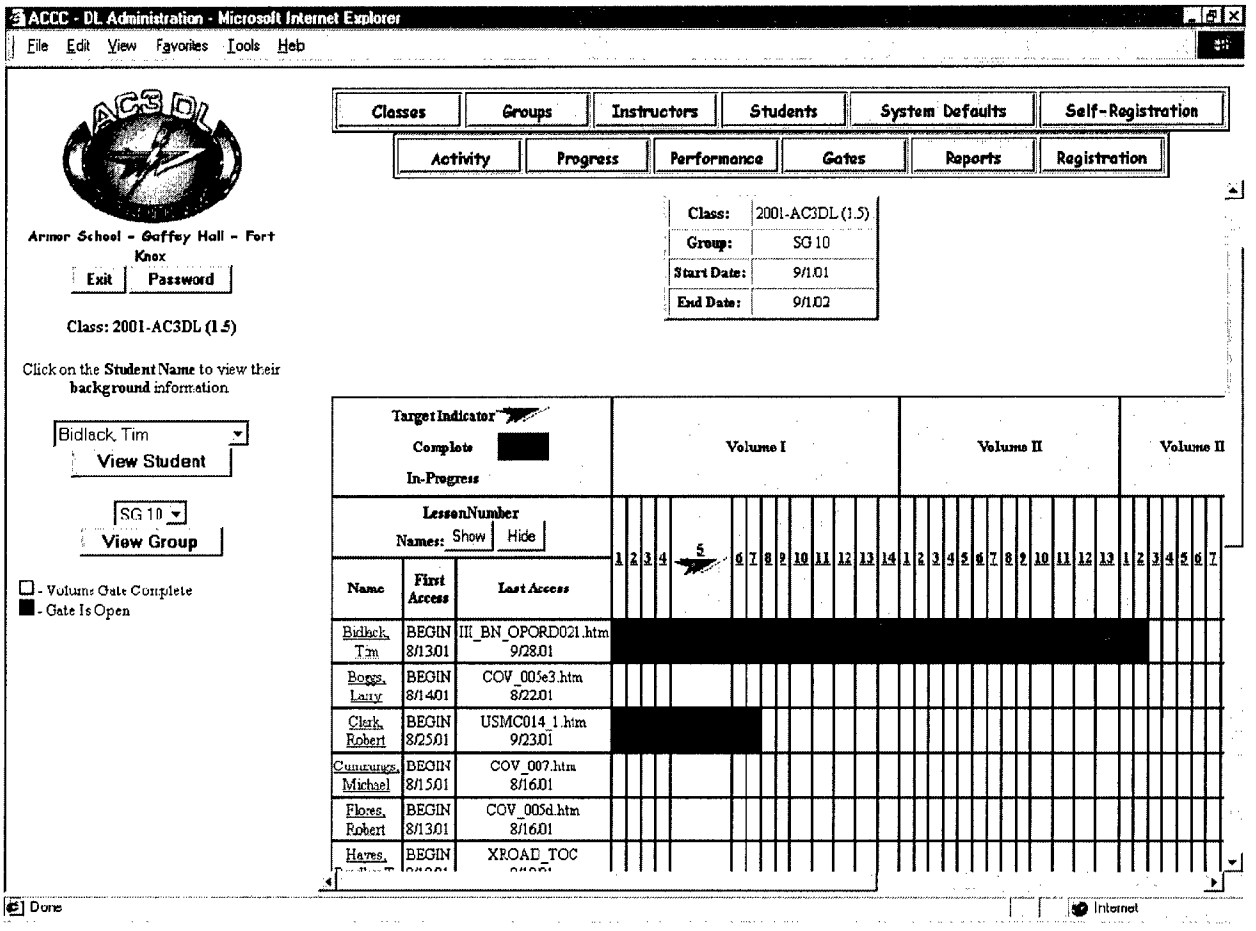
At the U.S. Army Armor School in Fort Knox, Kentucky, the use of collaborative learning environments is taking center stage in all phases of the Armor Captains Career Course (AC3-DL) (Wardell & Paschetto, 2000). In part, this form of training is meant to be a low-cost alternative to other common training practices. In addition, it is intended to offer more flexibility, choice, interactivity, and tracking than the previous use of a correspondence course combined with a final two-week residential training program. The purpose of the AC3-DL is to train captains to command companies and perform as assistant operations officers at command units such as a battalion. The course covers advanced leadership skills from planning combat missions to handling the supplies, maintenance, and information assets of a complex organization. The targeted population is first lieutenants or captains with four to six years of military service, often in their late 20s or early 30s. In effect, AC3-DL provides the necessary knowledge and skills for mid-level management of future military operations. The AC3-DL training is conducted in three phases; the first two are online (Phase Ia: asynchronous, and then Phase Ib: synchronous), while the final phase is face-to-face.

Phase Ia: Asynchronous Learning

The first phase of AC3-DL is the asynchronous component during which students learn basic terms and concepts via the Internet with both computer and instructor feedback. This self-paced stage, designed to be equivalent to a three-credit, college-level course, contains animation, interactive audio and video, and historical tracking of learner progress through each module. The content was estimated to be equal to about 240 hours of instruction with an instructor moderating and providing feedback on student progress. Delivery of this instruction was intended to take about one year, although highly motivated students can complete it in less time.

Each lesson has a set of objectives consisting of actions, conditions, and standards. To determine how well students are meeting these objectives, they are tested before and after each lesson as well as at the end of a complete volume of lessons. The lesson tests are multiple choice and graded by the computer. End of volume questions are embedded in longer "gate" tests that include both computer-scored multiple choice tests and instructor-graded problem-solving scenarios revolving around mission statements, decision matrices, and alternative courses of action. A student must earn 70 percent or higher on each part of a gate test before the instructor will open the gate and pass him through to the next volume or module. Students can retake end of volume tests until they obtain scores of 70 percent or higher. With the historical tracking within the learning management system (see Figure 1), instructors can determine the modules and components within particular modules where students are experiencing the most difficulty, as well as the present status of students in the course. In effect, instructors can project student attrition and completion rates, thereby allowing allow them to begin planning for Phases Ib and II.

Figure 1. Example of student history files in the asynchronous component of the course.



Phase Ib: Synchronous Learning

In the second phase, or synchronous component, students are placed into small groups or teams with other individuals from across the country while working in the Virtual Tactical Operations Center (VTOC), which contains a set of software tools developed specifically for this course. VTOC contains seven extensions (or rooms). One of these seven rooms is the "Main" extension, which opens to six others -- three on each side. Every extension or room has the same collaborative tools, making it possible for smaller groups to collaborate independently of the main group. Only one tool can be in use in each extension at any time. Therefore, if two students wanted to share the bookshelf, and another wanted to collaborate on an overlay, they would have to move to different extensions.

During this phase, the students collaborated in the VTOC. As indicated below, collaboration occurs through a live audio connection, real-time online chats, and the use of various software tools. There are four general ways to collaborate:

1. Every student appears as an avatar or virtual image in the 3D world, so others can see his "location."
2. Every student participates in an audio conference with others in the same extension (or room) of the VTOC. This audio conference allows anyone to speak at any time, and everyone else will hear him. The maximum number of participants is 15.

3. Every student has several text chat windows - one for the particular extension they are in, one that is global, and another private chat they can open by invitation that is shared with only one other person.
4. Every student can access various specially designed tools for collaboration (shared applications).

There are several unique collaborative tools available in the VTOC: (1) shared text, (2) shared bookshelf, (3) Mapedit, and (4) 3D terrain. These collaborative tools have some characteristics in common. For example, the first user to open the tool becomes that tool's driver (until the user relinquishes control by closing the tool). The driver chooses which file is to be opened, and if the work is saved, the driver names the file. In the case of shared text, the driver is the only one who enters text -- others (the followers) can only read what is written.

The shared text application consists of shared HTML forms[1]. Such forms for shared text application help students to write operations orders, warning orders, and other products that are part of the planning process. The shared bookshelf[2], in contrast, is used for displaying field manuals or "slide shows" that someone may want to review. The third tool, the Mapedit program[3], was developed to create map overlays, emulating plastic sheets on which symbols are drawn that are laid onto a map (see Figure 2). If students want a whiteboard, they simply open a blank overlay (no map background). Fourth, the 3D terrain is a collaborative environment that does not result in a product, but, instead, enables students and instructors to "walk" the terrain and lay an overlay on the ground. Such a tool provides users a different way to visualize their plans. Participants can click on another person's avatar, and they will see what that person sees. In this way, an instructor can take a group of students on a walk through the terrain, certain that their view will be the same as his.

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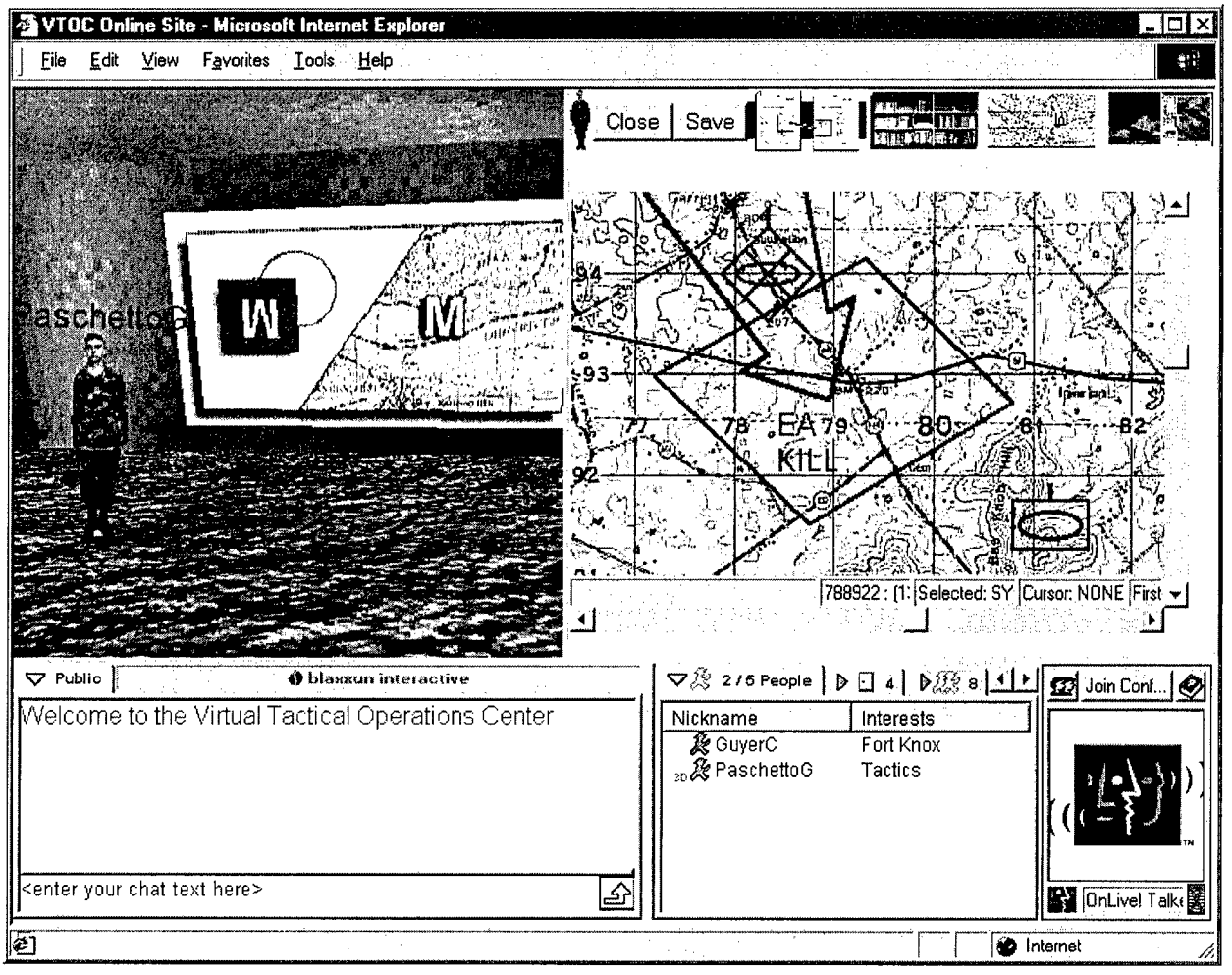
[1] The "driver" of the shared text application enters text, and chooses what "page" of the text form is visible. Followers are read only. However, followers can contribute to the content via either text chat or voice conference.
[2] In the shared bookshelf, the driver chooses what HTML document is visible, and followers then see that document.
[3] Mapedit allows multiple users to add, delete, and move symbols and lines on the map overlay. In Mapedit, the driver chooses which file to open, and names the file to save, but all users can edit the contents. Mapedit is used to share both overlays and other sketches (the only difference between Mapedit and a shared whiteboard is that an overlay has a map behind it).

Figure 2. Example of Mapedit feature in the VTOC.

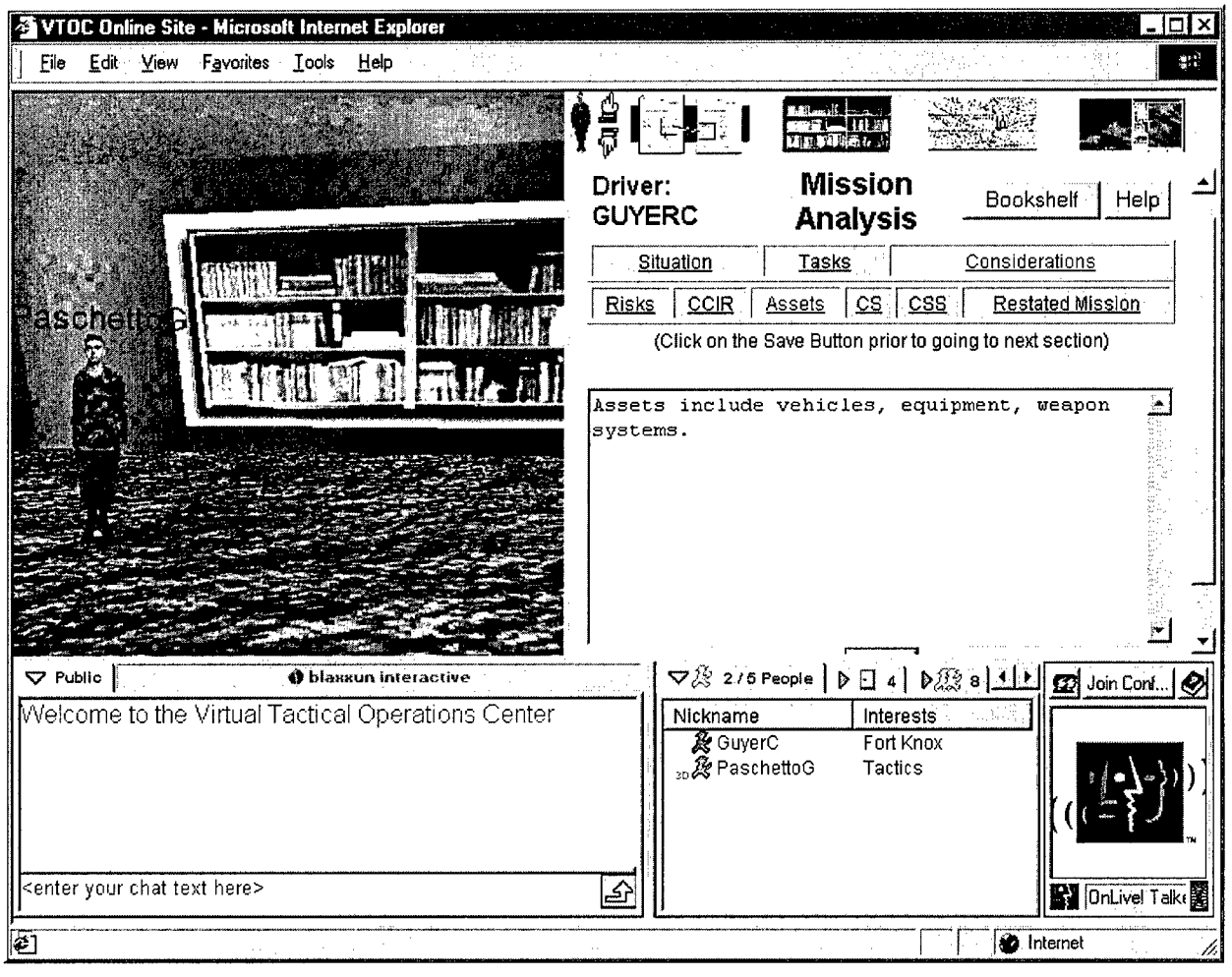


Using these collaborative tools, students worked with each other and the instructor for 10 weekends (or roughly 60 hours of asynchronous and 120 hours of synchronous instruction). In asynchronous mode, they acquired important background knowledge, while synchronously they engaged in a host of collaborative training exercises that resulted in a finished, doctrinally sound product. Synchronous collaborations were scheduled in advance and held during weekends. While asynchronous collaborations can occur through the use of e-mail, synchronous collaboration, as noted earlier, includes the use of a shared whiteboard for map editing, text chat with voice over IP (2 way and multipoint), the shared bookshelf, private chat, and the 3D terrain tool. Students also have access to a shared version of Microsoft Word, which includes opportunities for group editing and other collaborative writing activities.

The synchronous phase centers, in part, on groups of 10-12 students acting as battalion staff officers working together to build an operations order based on different staff positions that they have been assigned to. In these role-play situations, they engage in activities to create, share, and evaluate tactical plans. Such plans might address actions (e.g., critical events and decision points), direct and indirect reactions, intelligence, maneuvers, fire support, mobility, logistics, command and control, and other related items. One activity often used is a mission analysis which includes information gathering and critical reflection on terrain and weather,

enemy forces, facts, assumptions, limitations, specific tasks, implied tasks, assets available, additional considerations, and a proposed restated mission (see Figure 3). During this real-time training, AC3-DL instructors help students work through their tactical maneuvers and other decision-making activities. Given the complexity and deemed importance of this phase, studies are needed to examine the collaborative and interactive nature of these training events.

Figure 3. Example of a mission analysis in the VTOC



Phase II: Residential Learning

The third, and final, phase of AC3-DL took place at Fort Knox where the groups met face-to-face for the first time. Here they engaged in traditional classroom and field exercises. This two-week phase of group-paced instruction was delivered in a classroom, through constructive and virtual simulations, and on terrain. In effect, it was a capstone experience where students were challenged to apply the skills and competencies that they had acquired via distance learning (Wardell & Paschetto, 2000).

These three phases were designed to move from a focus on individual knowledge to small group collaboration and application skills to collective unit problem solving and decision-making.

Previous Research

Prior to this research, a few interesting research projects were conducted on AC3-DL. For instance, Sanders and Guyer (2001) conducted a 14-item survey of students and unit leaders involved in the AC3-DL program. The open-ended items in this survey related to factors negatively affecting student participation in this program. In particular, this survey inquired about policies, monetary incentives, course impact on other student responsibilities, and factors that contributed to attrition. While the response rate was relatively low (33 of 208 student surveys requests and 31 of 96 unit leader surveys requests were completed), there were some interesting trends that relate to findings reported in the present research. For instance, both students and unit-leaders were fairly positive about the AC3-DL program and noted that it was an improvement over the previous paper-based correspondence modes of delivery. Student attitudes about the benefits of Web-based instruction were generally more favorable than those from unit leaders.

The survey also revealed problems with the length of some of the course modules. In addition, several students reported time-related conflicts between their standard unit drill times and AC3-DL course time requirements. While one's present employment situation, technical problems with equipment, family responsibilities, and the course format were common asynchronous factors limiting participation, the key factors hindering synchronous course participation included employment, completing unit drill requirements, technology problems with equipment, course time requirements, and lack of compensation. Importantly, most of the students reported being very familiar with asynchronous tools for communication and at least somewhat familiar with synchronous chat tools. Various recommendations were made in this report concerning technology training, technical support, compensation, supplemental media, and lesson length.

A second study by Sanders and Burnside (2001) was conducted on the asynchronous component of the course to determine whether students in the AC3-DL program learned as effectively as those in the pen and paper correspondence course. These researchers found that students in the Web version of the course completed their training in less time than those in the correspondence version. Additionally, student and instructor surveys and interviews regarding the Web version of the course were generally positive compared to paper-based correspondence courses. In fact, the study revealed that there was content covered in the Web version of the course that was not addressed in the correspondence version. Small group instructors indicated that students trained via the Web were more likely to make effective decisions and develop a greater sense of team identity than the correspondence students. In addition, Web students demonstrated more organized planning, confidence in front of their peers, tactical proficiency, and general leadership and supervisory skills. A comparison of student knowledge in company team operations favored the Web group but was not significant. Nevertheless, there were student complaints concerning the length of some of the AC3-DL modules and training components as well as several problems and limitations with some of the technologies utilized in the program.

METHODS AND PROCEDURE

Background Information

Months prior to the focus group sessions conducted for this research, the DL Education Advisor and key assistants shared background information about the program and the technology during two separate meetings with the researchers. At those times, these individuals demonstrated integral aspects of the distance learning tools as well as samples of the text transcripts and associated instructor feedback. It was clear from these demonstrations, reports, and handouts that there was immense course planning and monitoring related to this course. All personnel involved in this project seemed genuinely interested in determining the impact and effectiveness of this new delivery mechanism. They were clearly focused on fostering student success. Hence, as a design team, they focused on creating a student-centered training environment.

Their reports noted that, from an historical standpoint, distance learning within the Army had undergone a series of transformations. Such training had included the use of paper-based correspondence during the 1940s to the early 1990s, televised teams during the 1950s to the 1960s, film strips in the 1970s, videodiscs in the 1980s, video-teletraining from 1992 to 1996, CD-ROM-based instruction beginning in the early 1990s, and Internet-based courses starting in 1997. In effect, AC3-DL was promoted as cutting edge courseware designed and developed for the Internet. Importantly, the new Web-based course format, which received national recognition for excellence in distance learning (Wardell & Paschetto, 2000), was based on recent cognitive and instructional design principles.

There were many unique aspects related to this courseware. For instance, it was intended to take advantage of the strengths of different delivery mechanisms including chat, e-mail, synchronous chats, virtual worlds, simulations, etc. One key component, the learner management system, was designed to provide useful and timely historical data and visual depictions of the modules that students completed. With this system, the progress of students through the asynchronous phase of the program, including testing activities, could be tracked and monitored. Instructor monitoring and evaluation of student progress combined with timely feedback and the ability to earn college credit was intended to reduce student attrition in the course. For instance, instructors were asked to provide e-mail feedback within 24 hours and gate testing feedback within 72 hours. Instructor involvement and individualized attention were key aspects of the course design. Such involvement naturally requires additional instructor training and support (Sanders & Burnside, 2001).

To foster a learner-centered environment, the content and activities were selected based on real-world situations and authenticity. Furthermore, different forms of media (e.g., audio, video, and animation) were intended to address a variety of student learning styles. As alluded to earlier, both asynchronous and synchronous training components were selected to address different learning needs. For instance, research indicates that while synchronous instruction might facilitate two-way interaction and socio-emotional interaction, asynchronous instruction tends to be used for one-way task completion efforts (Chou, 2000). Additionally, as shown by Bonk, Hansen, Grabner-Hagan, Brown, and Mirabelli (1998), while real time chat tools foster more responses per student and increased peer interaction, asynchronous tools promote idea development and evaluation in greater depth.

In this research, asynchronous tools included audio, video, and animation components meant to train complex cognitive skills. To enhance and perhaps complement the emergence of new cognitive skills and attitudes, synchronous tools allowed students to create, display, and share digital overlays and maps as well as communicate with peers and instructors. Early phases of the instruction were designed to foster particular student abilities (e.g., classification, writing, preparation, decision-making, planning, and critique skills), whereas later phases targeted other competencies (e.g., analysis, evaluation, monitoring, and specification skills). In assessments of those abilities, students received immediate feedback from a series of automated pre-tests, post-tests, and practical exercises. Learner engagement was addressed, in part, through more random tools (such as those they labeled "firefights"). In an attempt to further motivate students, many activities also had elements of fun, humor, and dissonance embedded in them. As motivational theorists point out (e.g., Reeve, 1996), such elements are often intrinsically motivating for learners. Clearly, in all phases, the focus was on assisting the learner to complete the AC3-DL course.

Interviews

In the present research, the purpose of the interviews was to gain a better understanding of the distance learning experience from both the instructors' and students' perspectives. The DL Education Advisor also provided valuable information including her views on the overall goals of AC3-DL. A primary interest, of course, was simply to assess the students' general reactions to the course. While such evaluation is aimed at the first level of Kirkpatrick's (1998) evaluation framework (i.e., student reactions), instructor observations were valuable in detailing how the distance-learning program impacted student conceptual learning (i.e., Level 2 of the Kirkpatrick model) as well as the transferability of skills learned online to real-world settings (i.e., Level 3 of the Kirkpatrick model).

In June 2001, interviews were conducted with eight students and three instructors recently involved the AC3-DL. In addition, the DL Education Advisor for the Armor School, who helped design the program, was interviewed. Most of these interview sessions were approximately one hour in length. The eight students, who were members of the Army National Guard, also completed a series of short questionnaires related to their backgrounds and experience with computer technology, the online learning environment, and the overall effectiveness of Phase Ib training (including workgroup attitudes, satisfaction, efficacy, and interpersonal as well as task cohesion).

RESULTS

Questionnaire Responses

Though somewhat small in number, the eight students that participated in the focus groups had vital perspectives and experiences since they had devoted several hundred hours to the distance-learning format of instruction. Important to an online course, all these individuals indicated that they had a personal computer available for their use and had access to the Internet at both their home and work settings. Of the eight students, two participants (25%) believed that in general, Internet instruction was more effective than classroom instruction, while six participants (75%) believed that classroom instruction was more effective. Overall, the students favorably evaluated their experience working in groups online and were extremely satisfied with the synchronous portion of the course. The students' responses also indicated high levels of both individual efficacy and collective efficacy with the synchronous portion of the course, and high degrees of both interpersonal and task cohesiveness within their teams. In addition, twenty items were adopted from a scale to measure the degree to which the online environment reflected a social constructivist learning community (Bonk & Wisher, 2000). Interestingly, participants tended to indicate that the environment represented an active or social constructivist community (average rating of 5.0 on a scale of 1 (Strongly Disagree) to 7 (Strongly Agree)).

Interviews with Student Focus Groups

Technological Obstacles

During the focus group sessions, it was apparent that there were several technological problems and obstacles related to the AC3-DL course. The most common technological problems that the students faced involved the virtual chat rooms and the map editor. Such technological problems can frustrate students, interfere with learning, and, ultimately, negatively impact student course completion rates.

Course Attrition and Incentives

Attrition is a pervasive problem in distance-learning courses in higher education settings (Bonk, 2001; Phipps & Merisotis, 1999) as well as in training environments (Bonk, 2002). Consequently, this was an issue addressed in the focus group discussions. During the two focus group sessions, the students were asked if they had ever considered dropping out and why. Seven of the eight students had never considered dropping out because they needed the course for career progression. Their answers reflected a key difference between military courses and many non-military courses--military students must complete specific courses if they want to advance in their careers. As an indicator of the importance of course completion incentives, the eight AC3-DL students interviewed here were sufficiently motivated due to opportunities for career progression.

Learning Environment

The results from the focus group discussions revealed that the overall learning environment helped students throughout the course. One area where the two focus groups differed involved student perceptions of the group environment within the AC3-DL program. One focus group felt that although they had never met face-to-face during the synchronous portion of the course, they were truly a team. These students stated that they engaged in small talk and shared personal information while they chatted. Such pedagogical activities enabled them to begin to understand the other group members' personalities, strengths, and weaknesses. In addition, all students felt that allowing different students to assume various leadership roles helped them learn to be "followers" and trust others as well as recognize the unique talents and strengths of others in certain knowledge areas. One student stated that the text chat enhanced the development of his relationship with the group because he had to reflect deeply on what he was going to "say" before typing and could do so without interruptions. However, in the second focus group, the students stated that they did not feel as much of a sense of camaraderie, but, instead, felt like "individuals struggling to work together as a team." They indicated that, while developing collaborative products enhanced group cohesiveness by creating a common goal, they often felt somewhat detached from the other participants and would not "stick their necks out" for other group members.

Instructor Role

Even though there were differences in the perceptions of the overall learning environment, the eight students overwhelmingly viewed the role of the instructor as a facilitator rather than a lecturer (see Coomey & Stephenson, 2001 for differences). In accordance with the original program's design goals, a key role of the online instructors was to provide direction and guidance that facilitated learning. Thus, feedback from the instructor was considered important. Not surprisingly, the students noted that they sought feedback on a consistent basis throughout the course in order to assess their progress. Another popular pedagogical technique was the use of early online introductions. Finally, while instructors coordinated the chats, they made a concerted effort to get everyone to contribute to the real-time discussions.

Perceived Advantages

Given the fact that most of these individuals had full-time jobs and families, it was not surprising that the primary advantages mentioned for taking the course online versus in a traditional classroom were flexibility and convenience. Along these same lines, the ability to work at their own pace and to be able to ask questions without feeling embarrassed or self-conscious were vital. Equally important was the "active" learning environment that was embedded in the course. Students appreciated the immediate feedback and mentoring from instructors about their progress. Most participants were not hesitant to contact the instructor via e-mail for such feedback. Whereas in the asynchronous portion of the course there was minimal interaction, the synchronous portion provided consistent feedback and interaction. Some students also appreciated the fact that, under special arrangements, the course could count towards credit for an advanced university degree. Others mentioned that they learned to work as a team while online. Still others felt that the online environment fostered more thoughtful

comments than normally found in conventional classroom settings. They argued that online environments encouraged more active learning than they would have experienced in a correspondence course.

Perceived Disadvantages

The participants stated that a key disadvantage of the course involved the length of the asynchronous and synchronous course components. As both the Sanders and Guyer (2001) and Sanders and Burnside (2001) reports revealed, the students felt that the asynchronous portion of AC3-DL was too long and filled with too much detailed information. This situation led most of the students to skip portions of Phase Ia just to get through it in a timely manner, whereas many of their classmates simply dropped the course[4]. One group added that the tests for each completed section were confusing since they utilized different formats. In addition, when students did complete a volume or module, they could not proceed without instructor permission, thereby taking away, at least in part, from the "learn anywhere, learn anytime" benefit of online learning.

In contrast, they claimed that the synchronous portion was too short. Some students, for instance, mentioned that this phase did not enable every group member to play a different role in the simulated exercises. They suggested that additional VTOC sessions would allow all members to experience the XO (i.e., Executive Officer) and S-3 (Operations and Training) positions. And while they claimed to definitely benefit from this phase of their training, the VTOC tool would, at times, mysteriously remove students from the chat rooms, thereby losing valuable training time while disrupting workflow. In addition, the map editing tool tended to freeze some computer systems, while the terrain viewer was not utilized as much as perhaps anticipated. When it did work, most students did not like the use of the avatar, which represented their physical presence in the operations areas within the VTOC. Finally, the VTOC was not compatible with the Macintosh computer platform. To alleviate some of these problems, these eight students recommended that the course designers and instructors focus on basic technology shown to function effectively rather than the latest gadgets or innovations.[5] As Scott (2001) points out, using a new technology (e.g., voice over the Internet) can be a mistake if it does not add perceived relevance and effectiveness to the course or solve a key problem. At the same time, students reported positive experiences with the voice chat and e-mail communication.

In addition to technological concerns, there were a few other disadvantages mentioned. For instance, the online examinations offered minimal feedback other than test scores. Students also stated that some of the modules could have been delivered and tested in smaller chunks, thereby focusing on specific accomplishments. It is conceivable that such an approach would have resulted in lower attrition rates as students would not be overloaded with information, but would be able to achieve a sense of accomplishment early in the course. A couple of students mentioned that there were uneven policies about the time they spent in synchronous weekend

[4] While the exact percentages were not stated, initial attrition rates for Phase Ia of AC3-DL was 50 percent for students who actively participated, and approached 75 percent if all students were included (Sanders & Burnside, 2001). Discussions with AC3-DL course developers and instructors indicated that the attrition rate was significantly reduced in later cohorts as the course delivery methods were modified.

[5] This is not surprising since research shows that online instructors and students tend to rely on simple tools such as e-mail, static or dynamic syllabi, Web links to course material, posting lecture notes online, and accepting student work online, while significantly fewer use online chatrooms, multimedia lectures, online examinations, animation, and video streaming (Bonk, 2001; Peffers & Bloom, 1999)

training, with some students receiving additional compensation or credit for this time. These participants argued that they should be compensated for attending the synchronous training in lieu of completing unit drill time requirements. Given that previous survey research on this course from Sanders and Guyer (2001) reported similar course incentive and module length issues, this is an area that warrants further attention.

Overall Impressions and Suggestions

Overall, the students enjoyed the distance-learning course and deemed the technology as truly "excellent." In fact, the only person who contemplated dropping out expressed time-related concerns. The students genuinely appreciated the course flexibility as well as the ability to work at their own pace during Phase Ia. Individuals in one group claimed that the skills learned during the synchronous training of Phase Ib readily transferred to the Phase II residential live instruction. However, some individuals in the other group claimed that their online learning activities did not transfer since Phase Ib criteria were at a lower standard than those experienced during Phase II. They argued that their document development activities were not realistic. Not surprisingly, these individuals felt that the most learning occurred in the residential portion of the program. They also thought that they worked the hardest in the residential phase since the synchronous sessions had definitive starting and ending points.

While most of these particular learners did not consider dropping out, they still felt that the course needed to be slightly restructured to further facilitate learning. Recommendations related to such structuring included more lectures and direct instruction before the synchronous portion of the course to provide a stronger knowledge foundation from which to draw upon. At the same time, participants proposed shortening the asynchronous phase of instruction by having fewer practical exercises, decreasing items on gate tests, and placing more attention on the quality of knowledge application rather than quantity. Another suggestion was a pre-orientation session to acquaint students with course expectations and tools, while simultaneously answering their questions and concerns. Along these same lines, students suggested that proponents of the course find a way to display the course to battalions around the United States, thereby prompting their interest in the course as well as an awareness of course requirements. Finally, while the majority of the students argued that this course was best presented online, all students felt that the face-to-face portion of the course was still vital because that was where it "all came together."

Interviews with Course Instructors

Instructional Role and Philosophy

Interviews with the course instructors provided further insight into the strengths and weaknesses of teaching this complex, Web-based course. First, the online instructors did not view their roles as much different than that of regular classroom instructors. While they felt that they served more of a facilitative role, providing students with the means, tools, and guidance to learn effectively, they contended that the only major differences between teaching online and teaching in a classroom were that they could not see their students and instead of writing grades on students' assignments, they sent them e-mails. Although two instructors emphasized that they

allocated the bulk of their time to course planning, the third instructor indicated that he had spent much more time on the administrative aspects of the course. Nonetheless, they all indicated that a key goal of the program was fostering good decision-makers and problem-solvers who can apply what they learned to real-life exercises.

As a whole, the instructors felt that the online course fit nicely into a small group instruction model and strongly complemented the Army's "crawl, walk, run" philosophy of learning. In effect, Phase Ia, or the asynchronous portion of the course, provided the basic foundation ("crawl"), Phase Ib, the synchronous portion, allowed the students to put their knowledge to use in electronic and paper formats ("walk"), and Phase II, the resident portion, prompted the students to fully apply their knowledge and skills in real-life scenarios ("run"). Interestingly, two instructors were retired officers who were highly familiar with this three-part training philosophy. Neither claimed much difficulty with the technology nor the instructional methodology. In fact, retired officers familiar with small group training methods and the overall philosophy of learning espoused here may be the best suited instructors for such an approach.

Instructional Techniques

The instructors noted that certain instructional strategies and pedagogical approaches were useful in online environments to facilitate student learning and to encourage participation. Whereas the asynchronous phase involved more directive and one-way instructional techniques aimed at learning basic concepts and information, instructors utilized more indirect questioning, prompting, and nudging in the synchronous phase. The instructors indicated that they were genuinely interested in student progress throughout the course and that they were there to help students succeed. For example, they sent out weekly reminders about assignments, used indirect questioning and prompting to engage and involve students, and attempted to place each person in a leadership position within their groups, where possible, to boost their confidence levels.

Instructional tactics such as selecting students to be in charge of activities were intended to boost student participation during the synchronous component. Generally, the course instructors felt that these tactics were successful in achieving that goal. The instructors also found that matching weaker students with strong leaders was beneficial. In fact, they noted that this often resulted in the respective groups supporting poor performers on their own with little help requested from the instructors.

Perceived Advantages

The course instructors praised the course highly. One instructor claimed that advantages of the Web-based course included the ability to provide specific and detailed feedback on student work, greater learning and application of knowledge by students, and more standardization of course content. The other two instructors stated that a key advantage of the synchronous course sections involved teaching students how to work with others as a team to solve a problem. In addition to problem solving and teamwork, they contended that it enhanced students' communication skills. Given the rise of communications technology and the need for team skills in most work settings, claims that distance technologies have a positive impact on such skills are important. Other advantages mentioned included allowing students to get the most current and updated material, providing students with immediate feedback, and equipping reservists with skills and training equal to that of active duty soldiers. As expected, they also mentioned that the

distance course provided an additional avenue for those who wanted to advance their military careers.

The instructors noted that students benefited from both asynchronous and synchronous technologies. For instance, the synchronous component offered students immediate feedback, mentoring throughout the process, and the opportunity to interact with both peers and the instructors. Although the instructors' responses indicated that they valued the "virtual talk" aspects of the VTOC since it approximated talking face-to-face, they did not, however, view it as beneficial when forced to use it as a means of instruction. One instructor claimed that it was important to let students know what positions they were going to assume in the VTOC beforehand and to assign them specific materials to study. He also sensed that the ability to call on students to answer questions in the voice chat increased student participation. This instructor argued that most learning took place in the synchronous and resident phases rather than in the asynchronous phase.

In terms of the asynchronous or delayed discussion, all instructors claimed that students were effectively mentored as they progressed through the systems and learned new concepts and ideas. Moreover, they felt that feedback was promptly received during this phase and was based on progress as well as performance. Most of this feedback was provided through e-mail, however, not directly in an electronic portfolio of work or in the student activity records within the learning management system. Despite the strong reliance on e-mail, the instructors found benefits from the other technologies employed in the asynchronous phase as well. Whereas the synchronous technology was useful for helping students learn how to work together as well as how to apply knowledge, the asynchronous phase was a more directive and one-way approach to the learning of basic information. In effect, the asynchronous phase prepared students for the synchronous phase.

Assessment was different in Phase Ia (asynchronous) and Phase Ib (synchronous). In the asynchronous phase, objective forms of measurement (e.g., multiple choice, matching, etc.) were utilized. In the synchronous portion of the course, however, grading became more subjective as instructors evaluated student military plans. Consequently, they relied on criterion scoring checklists and guides to evaluate and grade the student products.

Perceived Disadvantages

While these instructors did not indicate many disadvantages, they did report fairly high attrition rates compared to correspondence courses. They sensed that part of the problem was that they lacked mechanisms to control the size of content modules during the asynchronous portion of the course. As a result, these students had to fit a fairly robust and demanding curriculum into their already full lives. Early modules or "volumes" in the asynchronous phase were particularly difficult, according to the instructors. Those who made it to the second volume usually had the stamina and motivation to complete the entire course.

Overall Impressions and Suggestions

Overall, the instructors enjoyed teaching the course online and using the technology. They felt that not only were the students going through the distance learning course better trained than those taking the course through correspondence, but that the distance learning course provided the students with general skills such as problem-solving and group communication that

are applicable to any position in the Army and could not be gained from a correspondence course. In fact, they recommended eliminating all correspondence courses in favor of those offered via distance learning, especially for Army recruiters and commanders spread out across the United States. When asked about advice they might offer regarding similar projects, they suggested focusing on tools and methods that foster interaction, providing instant or at least consistent feedback, and utilizing and promoting the ability to post, share, and reflect on student products.

Interview with DL Education Advisor

The interview with the DL Education Advisor for the Armor School provided some valuable information concerning the design of distance learning courses based on her experiences with the Armor Captains Career Course and other distance learning courses within the Army. This interview also confirmed many of the focus group findings from the students and instructors.

Overall Perspective

Two previous meetings with the DL Education Advisor indicated that she was quite pleased with the program and was an avid supporter of it. At the same time, she was interested in additional course evaluation, especially as it might improve student completion rates, help fine-tune course production and system resources, and lead to enhanced online Web-based instruction tools and strategies. She emphasized the fact that anyone involved in the development of distance learning technology must be flexible and adaptable because the technology is changing so rapidly that one cannot just look at where the technology is now, but must also consider where it will be a year from now. Not surprisingly, the course tools for this program were, in fact, utilizing many current hardware and software technologies.

Theoretical Perspective

The DL Education Advisor was extremely cognizant of learning theory. While noting constructivist (Duffy & Cunningham, 1996) and learner-centered principles (APA, 1993) related to flexibility, variety, choice, meaningfulness, performance assessment, and learning in authentic contexts, she also pointed to practical exercises that they attempted to embed in the course to help students learn the content. She emphasized that while learning key terms and concepts were important, application of these terms and concepts was the ultimate goal. With the purpose to train these students to command companies and other similar duties at battalion and brigade levels, it was imperative to focus on bottom-line command readiness. In effect, student understanding was deemed to grow from use. While the Internet provided the mechanism for course delivery, she recognized that it was not giving them everything. Clearly, the learning environment extended beyond the Web.

Caveats and Tips

For those wanting to replicate aspects of this program, the DL Education Advisor provided several caveats and tips. For instance, she claimed that any distance-learning course

must be adaptable and flexible to changes in learner needs, content requirements, and available technology. While one must remain open to new possibilities, there are many risks involved in exploring and selecting a particular technology. Consequently, she argued that leaders must be able to simultaneously evaluate current technologies for student learning needs as well as those that loom on the horizon.

To help others in comparable roles, and for those who are designing similar programs, she outlined six important considerations in the design of distance learning courses. First, she stated that all courses should involve direct, e-mail feedback. Her rationale for this principle was that students need to feel connected to both each other and to the instructor and they also need to have a way to assess their progress. Second, she claimed that courses should have meaningful content that allows students to directly apply the material to real-life exercises. Concerning the AC3-DL course, meaningful content typically involved combat situations and combat readiness. Third, there should be minimal extraneous content (e.g., extra graphics as well as practice exercises) so as to limit student confusion and course complexity. Her team has found that students will skip optional or periphery materials if they feel cognitively overwhelmed. Fourth, designers of distance learning courses should carefully analyze their target audiences so they can accurately determine what they want and need out of a course. Fifth, distance-learning courses should offer flexibility, choice, variety, meaningful contexts, and performance opportunities. Many of these principles relate to the learner-centered principles from the American Psychological Association (APA, 1993). According to the DL Education Advisor, it is vital to create an active learning environment with a balance between flexibility and learner accountability. Not surprisingly, she readily admitted that the instructor was a key part of that environment. With prompt instructor feedback, students were not isolated in their online learning endeavors. Lastly, designers should limit their visions and not stretch the expectations of technology too far beyond the tools and options that have been proven to work. The DL Education Advisor argued that there would always be room for improvement but that one has to start somewhere.

Perceived Disadvantages or Problems

The DL Education Advisor noted several problems with the current system. First, many students wanted printed copies of the course materials. Given the online availability of the course materials, however, she felt that this would amount to an excessive waste of paper. Second, the learner-management system was not flexible enough for most of the students and instructors. For instance, as alluded to earlier, some students voiced frustration that they could not move on to another volume if they missed too many items on the gate test. Third, since there was not ubiquitous access to the Internet, some activities and events may not always have been available to students across settings. Fourth, in addition to Internet access, some students wanted access to course materials via CD-ROM. Access to materials in CD format is problematic, however, since the Army would lose much of the ability to track student progress and problems. The DL Education Advisor noted that the Army was interested in knowing that students truly learned the online materials and were obtaining new skills and competencies, not just simply looking up answers to test questions. In reflecting on overall program goals and expectations, she admitted that this was primarily an issue of control.

Summary of Findings

Web-based Instruction Advantages and Disadvantages

As detailed in Table 1, across the students, instructors, and the DL Education Advisor, there were a number of distinct advantages and disadvantages noted during the focus group sessions. The framework of Table 1 emerged from the qualitative data collected and analyzed.

Table 1. Perceived Advantages and Disadvantages of Web-based Instruction

	Advantages	Disadvantages
Students	1. Course offers flexibility and convenience to those working fulltime. 2. Students can work at own pace. 3. Immediate feedback and mentoring can be received online and at any time. 4. Online learning environment can be structured for active learning. 5. Students learn to work together while online. 6. Online chats fostered thoughtful commenting and reflection.	1. Lack of a pre-orientation session to detail course expectations and tools. 2. Length of course components did not match student needs and abilities. 3. Novel technologies are often difficult to use and tend to crash or impair student computer systems. 4. Lack of flexibility in the system forcing students to learn in a preset order. In addition, permission of instructor required before moving to additional modules or volumes. 5. Minimal feedback offered in asynchronous examinations other than scores received. 6. High attrition fostered, in part, by large modules. 7. Sense of community and group identity takes significant forethought and planning on the part of the instructors.
Instructor	1. Fits existing small group model of instruction used by the Army. 2. Could tailor instructional strategies to the form of content delivery. 3. Capability to provide immediate feedback on student work. 4. More detailed feedback. 5. Group interaction among students could help boost the confidence of lower performers. 6. Greater learning and application of knowledge. 7. More standardization of content. 8. Teach students how to work together to solve problem situations.	1. High attrition or low completion rates. 2. Excessive student time commitments. 3. Lack of instructor control over size of content modules.

	9. Help students to stay up-to-date with their knowledge. 10. Enhances communication skills. 11. Timely opportunities for online mentoring.	
DL Education Advisor	1. Course can take advantage of recent advances in technology and theory. 2. Can embed different forms of media to address different student learning style needs. 3. Technology tools allow for historical tracking of student work and learning. 4. Authentic and meaningful activities can be embedded in online learning.	1. Many risks involved in selecting a particular technology. 2. Hard to be aware of future technologies while dealing in present technology problems and issues. 3. Too many choices or information sources can overwhelm learners. 4. Some students wasted paper when had electronic versions of materials. 5. Some students asked for CD-ROM versions of the course materials when already had Web access and the potential for a paper version. 6. Learning management system was not as flexible as needed.

Web-based Instruction Considerations and Issues

The DL Education Advisor focused on overarching design issues or guidelines. In a review of the focus group and interview data across participants, as well as the course materials, reports, and handouts provided by the DL Education Advisor and her staff, there were ten key design considerations or issues for Web-based instruction consistently mentioned by the students, instructors, and supervisors. These ten areas, detailed in Table 2, are not intended to be exhaustive but, instead, are simply a summary of key findings from the focus group discussions.

Table 2. Web-based Instruction Considerations and Issues

Web-based instruction consideration or issue	Student Advice	Instructor Advice	DL Education Advisor Advice
1. Feedback.	E-mail is important mechanism for contacting instructors.	Provide instant and consistent feedback with e-mail and other tools.	Involve direct e-mail feedback.
2. Meaningful and Real-World Content	The construction of online products should approximate real-world application.	Require students to produce products that instructors and peers can evaluate.	Include meaningful content and allow students to apply new skills to real-life exercises.
3. Size and Scope of Content Materials	To maintain motivation and increase completion rates, divide asynchronous content and testing into smaller units or accomplishments.	To increase student completion rates, instructors need some control to change the size of content modules.	Utilize minimal extraneous content, graphics, or practice exercises.

4. Course Development and Organization	A pre-orientation session will help address questions and concerns about the online course. Students need lecture and direct instruction before project work.	Learn basic content in asynchronous phase ("crawl"), put knowledge to use electronically and on paper in synchronous phase ("walk"), and apply knowledge in real-life scenarios in residential phase ("run").	Carefully analyze target audience wants and needs prior to course development.
5. Role of Instructor	Instructor is helpful as a facilitator of learning. The same instructor should support students across all phases of online training.	Instructor role is more of a facilitator of the learning process; providing tools, means, and guidance to learn effectively. Indirect questioning, prompting, reminders, role playing, and direct requests are ways to engage and involve students.	Instructor provides feedback and sense that someone cares about their learning.
6. Small Group Structuring	In online role-play, rotate roles among group members.	Match stronger leaders and weaker students in role-play activities to boost performance and confidence. Provide instructions and information prior to online events such as role plays and product discussions.	Create active environment with role-plays and simulations, but must provide balance between flexibility and learner accountability.
7. Flexible and Active Learning	Be flexible and allow students to complete online modules at their own pace; minimize need for instructor to certify students are ready for next step or phase.	Distance learning helps Army Reserve students fit training into busy schedules and keep up with active duty personnel.	Offer flexibility, choice, variety, meaningful contexts for learning, and student performance opportunities.
8. Technology Utilization	To minimize frustration and downtime, utilize basic functions or technologies, where possible.	Use asynchronous communications for learning basic concepts and synchronous communications for application.	Limit technological visions and begin to incorporate technology based on what it can presently accomplish.
9. Build General Skills Through Online Communication, Problem-Solving, Teamwork, and Identity	Small talk, introductions, and information sharing helps form team identity.	Communication skills, problem solving, and teamwork are general skill outcomes of interactive distance learning. Online tasks should involve teaching students how to work with each other on a team to solve a problem. Teamwork and virtual talk among small groups fosters interaction and participation.	Courseware structured to move from individual effort (asynchronous component) to application exercises in small group collaboration activities (synchronous component) to problem solving in collective efforts within units (resident component) is a useful framework for fostering student learning.

10. Assessment Practices	Online assessments should closely match real-world expectations. Focus might shift from quantity of learning or breadth across areas to quality or depth of learning in particular areas. Assessments should also cover smaller amounts of instruction or learning.	Asynchronous learning is more ideally suited for objective tests and measurements, while synchronous might be used for student performances or products and criterion referenced evaluations.	Online assessments can include automated pre-tests, post-tests, and practice exercises that provide immediate student feedback. Random feedback or assessment tools are also beneficial. While evaluation gates require application of learning, the learning management system needs to be more flexible and adaptable in regards to items missed on gate examinations.

Many of the above considerations and issues reflect a constructivist and learner-centered teaching perspective thought to be important in the use of collaborative technologies (Bonk & Cunningham, 1998). Similarly, Bonk and Cummings detail 12 guidelines for Web-based instruction (e.g., providing prompt feedback, giving students choice, establishing psychologically safe learning communities, etc.) that directly link to the one or more of the 14 learner-centered principles (American Psychological Association, 1993). Furthermore, in a review of Web-based support systems, Oliver and McLoughlin (1999) detail a number of ways constructivist practices can be defined in terms of Web-based supported tasks and processes of learning. For instance, the goal of authentic learning might be realized through project-based learning, including access to databases that engage students in real world tasks. Along these same lines, the goal of active learning might be supported through the creation of reports, Web pages, or student online commenting on peer work, which could involve processes related to exploring interests and ideas, comparing and synthesizing resources, and revising original ideas. In effect, Oliver and McLoughlin believe that the combination of appropriate instructional activities with Web-based tools and resources can support constructivist types of learning. However, they point out that many questions remain related to how to develop rich Web resources such as the AC3-DL course while supporting student active learning and collaboration.

CONCLUSIONS

There were many distinct advantages as well as disadvantages related to this distance learning course. The results from this research indicate that online learning does allow for greater and timelier feedback, authenticity, convenient and meaningful learning, and increased communication. On the other hand, too many choices can overwhelm learners, and what may appear to be a flexible system may not be when constrained by technology downtime or lack of system familiarity. Interestingly, while feedback may be made an instructional priority and a success story in one phase of online instruction, in another phase, it may seem lacking to online students. Certainly synchronous events appear to have more opportunity for a sense of peer and instructor responsiveness than asynchronous activities. Instead of focusing on how to exploit the benefits of synchronous training, however, research by Hiltz (1998) suggests that the success of asynchronous learning may hinge on the degree of collaborative learning and interaction in the course. Regardless of the distance learning technologies employed in the AC3-DL, time commitments were a prevalent factor impacting student participation and success rates.

As indicated, there were a number of Web-based instruction principles or considerations that emerged during the interviews and focus group discussions. Not surprisingly, these areas related to the role of the instructor as the facilitator and organizer of the learning process, the need to embed tasks that require active learning, problem solving, and teamwork, the caution to not simply select technologies because they exist, and the need to think about how assessments may vary based on the phase of learning entered into as well as the technologies available to assist and assess student learning. Additional principles or topic areas addressed the need for consistent and prompt student feedback, meaningful contexts for student learning, thoughtful structuring of group or team activities, and extensive course planning and organization. Whether these are the primary or sole ingredients of online course success remains to be seen.

Clearly, for students interested in moving up within their military careers, AC3-DL appears to be a successful and rewarding online course experience. It was interesting to discover how novel instructional technologies embedded within AC3-DL activities intersected with new forms of teaching and learning. During the focus group sessions, there was a definite feeling of commitment from all parties involved. What caused such feelings? First, the learners had a goal to complete the training. Second, the instructors were highly involved and enthused about delivering instruction in a new way. Third, the DL Education Advisor and her staff were extremely supportive and interested in student success within the program. To obtain this success, they attempted to link sound instructional design principles with recent inroads in cognitive psychology as well as advances in instructional technology. In effect, all three parties—students, instructors, and administrators—had incentives that were vital to student completion and program success. Despite several significant obstacles and problems, this team was successful in meeting their goals. They utilized sound instructional design ideas and principles, built and delivered courseware over the Internet, allowed for geographically dispersed students and instructors to collaborate in real time as well as in delayed modes, and tracked, monitored, regulated, and provided feedback on student progress.

While the focus group discussions and interviews revealed several problems in the AC3-DL course that slowed or hindered student completion rates, the course administrators have already implemented a number of changes to the course sequencing that have enhanced and accelerated student completion. In the newer version of the course, students alternate individual

work within the asynchronous courseware with a weekend of collaborative work in the VTOC (i.e., synchronous training). With this format, there are now seven weekend VTOC sessions instead of ten. Many of the focus group students we interviewed were actually involved in the transition to the new AC3-DL format. According to the DL Education Advisor, if students keep up with the content, they can now finish the program in 12 to 16 months. In fact, one recent "go-getter" completed it in just 9 months.

The AC3-DL team has also begun supporting students with expert mentoring in the VTOC. In such mentoring sessions, the interface is slightly different so that guest experts and other visitors do not need to log in or control complex collaborative tools, but instead meet in a 3D meeting hall that simply relies on text chat and voice conferencing. While visitors can request a virtual microphone, the team currently asks most visitors to pose questions and comments via the text chat, thereby leaving the voice conferencing for the guest speaker. Use of the VTOC for mentoring has the potential to expand the instructional capabilities and responsiveness of the program. Consequently, it might prove valuable to explore the types of mentoring approaches provided as well as student preferences and attitudes. In addition, research might explore how questions are raised and addressed as well as how the content of the guest mentoring impacts student course performance and motivation to complete the program.

There are many avenues for course and tool development as well as student testing and evaluation within military e-learning as well as in higher education, K-12, and corporate settings. As new developments unfold, it is imperative that researchers, scholars, instructors, administrators, and politicians, who too often are struggling just to stay abreast of developments in their own field, become aware of common findings or themes within e-learning research and teaching efforts across these settings. The present research provided one look at the advantages and disadvantages as well as many instructional considerations and issues within a unique online learning program. Other studies might explore completion rates, attitudes, and overall learning when one's career is not contingent on course completion.

Certainly, the military setting of this course offered a unique training need, extremely committed instructional designers and instructors, highly motivated students, timely instruction and feedback, and the funding to build and employ novel technologies. As similar online courses are generated in other settings, it is hoped that course developers and online instructors will expand, modify, and utilize some of the key considerations and principles mentioned here, while also exploring the advantages and taking significant steps to limit the disadvantages.

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